



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,396	04/08/2004	Chung-Hui Chen	TS01-1339	8456
42717	7590	10/19/2006		
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202				
EXAMINER ALANKO, ANITA KAREN				
ART UNIT			PAPER NUMBER	
1765				

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/820,396		CHEN, CHUNG-HUI	
	Examiner		Art Unit	
	Anita K. Alanko		1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/10/06 amdt.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6,8-14,27 and 46-50 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 2-6,8-14,27 and 46-50 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-6, 9-10, 13-14, 27, 46-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Begley et al (US 6,211,056 B1).

Begley discloses a method for the creation of a suspended inductor 242, comprising the steps of:

providing a substrate 238;

creating an inductor in or adjacent to the surface of a layer of dielectric 236, 247 overlying the surface of said substrate (Fig.1);

exposing surface areas of said layer of dielectric (by mask 245, Fig.4); and

etching the exposed surface area of said layer of dielectric (col.4, lines 46-49), thereby creating an air gap in said layer of dielectric, said air gap surrounding said inductor (Fig.5).

As to amended claim 2, Begley discloses to deposit a dielectric layer 236 and an etch stop material 247, patterning and etching the etch stop (Fig.3), etching the dielectric (Fig.1) and filling said pattern with an inductor material 242 (Fig.1).

As to claim 3, Begley discloses to at least partially remove the etch stop layer (Fig.3, during etch-back.)

As to claims 4, 9 and 13-14, Begley discloses to form pillars 248 (Fig.7) or 112, 114, 116 (Fig.15, which includes creating patterned and etch overlying layers of semiconductor polysilicon material).

As to claim 5, the etch has high etch sensitivity since the dielectric is etched (Fig.5).

As to claim 6, the etch uses an etchant that produces a cavity with a slope (both vertical and at an acute angle to the top surface, Fig.5).

As to claim 27, etch stop material, Si_3N_4 (col. 4, l. 31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begley et al (US 6,211,056 B1) in view of Zhao et al (US 2002/0148807 A1).

The discussion of Begley from above is repeated here.

As to claim 8, Begley fails to disclose the specific etchant cited. Zhao teaches that HF etchants are known and useful for forming devices suspended over a trench ([0005]). BOE are also conventional. Concentrations, time and temperature of the etchant species determine the type and speed of etch. It would have been obvious to use the etchant cited in the modified method of Begley because Zhao teaches that HF etchants are useful, BOE are conventional, and

varying to the composition, time and temperature cited since they appear to reflect result-effective variables, which can be optimized. See MPEP 2144.05 IIB.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begley et al (US 6,211,056 B1).

The discussion of Begley from above is repeated here.

As to claims 11-12, Begley does not disclose the thicknesses of the layers, however they are expected to be similar since the same steps are disclosed as in the instant invention, for forming a device with the same characteristic of reduced parasitic capacitance affecting high frequency responses (col.2, lines 1-7). The thickness determines the characteristics of the final product. Therefore, it would have been obvious to one with ordinary skill in the art to form the layers to the thicknesses cited in the modified method of Begley since the same product is formed and the thickness appears to reflect a result-effective variable, which can be optimized. See MPEP 2144.05 IIB.

Response to Amendment

The 35 USC 112, 2nd paragraph rejections are withdrawn in view of the claim amendments and cancellations. Since the pad oxide limitation was deleted from the claims, the claims are now rejected under 35 USC 102 over Begley.

Response to Arguments

Applicant's arguments filed 8/10/06 have been fully considered but they are not persuasive. Examiner acknowledges that applicant's structure consists of suspended inductor material 34 alone, however the claims are not commensurate in scope with this argument. Begley's dielectric surrounds the inductor, however this is not in conflict with the claim since air also surrounds the inductor. An analogy would be that a pencil is on a table, whether it is on a piece of paper, which is on the table, or whether it is directly on the table without an intervening layer. Similarly, the inductor is surrounded by both a dielectric and air.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 2:30 pm (Wed until 11:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anita K. Alanko

Anita K Alanko
Primary Examiner
Art Unit 1765